

CLAIMS

1. A shoe (10, 100) with breathable and waterproof sole and upper, comprising a breathable and waterproof sole (11, 111) and an assembly (12, 112) that is associated with said sole (11, 111) in an upward region and is  
5 constituted by:

- an external breathable upper (13, 113), an internal lining (14, 114) and, between them, a breathable and waterproof membrane (15, 115),
- an at least partially perforated or breathable insole (16, 116), which  
10 is joined at least to said upper (13, 113) and said breathable and waterproof membrane (15, 115),

said breathable and waterproof sole (11, 111) being at least partially overmolded on said assembly (12, 112), said shoe (10, 100) being characterized in that said upper (13, 113) is provided with passages (26, 126) toward said breathable and waterproof membrane (15, 115) for the  
15 polymeric material during the overmolding of said sole (11, 111), said passages (26, 126) being arranged substantially at the connecting region (17, 117) between said upper (13, 113) and said breathable and waterproof membrane (15, 115), said sole (11, 111) being joined hermetically and  
20 peripherally to said assembly (12, 112) in said connecting region (17, 117).

2. The shoe (10) according to claim 1, characterized in that said sole (11, 111) is composed of at least one perforated lower layer (18, 118) and of at least one upper layer (19, 119), which is constituted by an external peripheral skirt (20, 120) and is centrally constituted by a breathable  
25 element (21, 121), which is arranged substantially at the portion of said insole (16, 116) that is assigned to vapor permeation, a breathable and waterproof membrane element (22, 122) being arranged between said lower layer (18, 118) and said upper layer (19) and being joined hermetically, in its peripheral region (24), to the assembly of said sole (11, 111), said skirt  
30 (20, 120) completely overlapping said connecting region (17, 117) between

said upper (13, 113) and said breathable and waterproof membrane (15, 115), the adhesion of said skirt (20, 120) to said breathable and waterproof membrane (15, 115) forming said seal between said assembly (12, 112) and said sole (11, 111).

5        3. The shoe (10) according to one of the preceding claims, characterized in that said insole (16) is joined at least to said upper (13) and said membrane (15) in said connecting region (17) by means of a stitched seam (17a) of the strobil type, said passages (26) being provided by forming a "deep undulation" (27) on the lower edge (28) of said upper (13), so that  
10   said stitched seam (17a) joins only the crests (28a) of said "deep undulation" (27) to said membrane (15) and said insole (16).

4. The shoe (100) according to claim 1 or 2, characterized in that said insole (116) is joined at least to said upper (113) and said membrane (115) in said connecting region (117) by gluing the lower edges (128) of at least  
15   said waterproof and breathable membrane (115) and said upper (113) that are folded under said insole (116), said passages (126) being constituted by through holes (127) provided in the portion of said upper (113a) that is folded under said insole (116).

5. The shoe (100) according to claim 4, characterized in that said  
20   lower edges (128) lie adjacent to the breathable element (121) of said sole (111), said lower edges (128) being in practice locked in a sandwich-like fashion between said perforated insole (116) and said skirt (120).

6. The shoe (10, 100) according to one of the preceding claims, characterized in that the peripheral region (24) of said breathable and  
25   waterproof membrane element (22, 122) is incorporated in a sandwich-like fashion between said skirt (20, 120) and said lower layer (18, 118).

7. A shoe (200) provided with breathable and waterproof sole and upper, comprising a breathable and waterproof sole (211) and an assembly (212), which is associated with said sole (211) in an upward region and is  
30   constituted by:

- an external breathable upper (213), an internal lining (214) and, between them, a breathable and waterproof membrane (215),
- an at least partially perforated or breathable insole (216), which is joined at least to said breathable and waterproof membrane (215),

5        said shoe (200) being characterized in that it comprises a waterproof inshoe (227), which is at least partially perforated or breathable at the region of said sole (211) that is assigned to vapor permeation, said inshoe (227) being associated in a downward region with said insole (216), its peripheral edge (230) completely overlapping the connecting region (217) between  
10    said insole (216) and said breathable and waterproof membrane (215) so as to provide a peripheral seal, said upper (213) adhering to said inshoe (227), said breathable and waterproof sole (211) being associated hermetically and peripherally with said assembly (212) only at said upper (213) and at the exposed portion, if any, of said inshoe (212), without affecting the  
15    remaining central part that corresponds to the region assigned to vapor permeation.

8. The shoe (200) according to claim 7, characterized in that said insole (216) is joined to at least said breathable and waterproof membrane (215) in said connecting region (217) by means of a stitched seam (217a) of  
20    the strobil type, said perimetric edge (230) forming lateral sides (230a) of said inshoe (227), which rise beyond said stitched seam (217a), adhering completely to said breathable and waterproof membrane (215) and forming said peripheral seal, said upper (213) adhering to said inshoe (227) and having a lower edge (228) that is folded and glued so as to adhere under  
25    said inshoe (227).

9. The shoe (200) according to claim 8, characterized in that said inshoe (227) is provided by direct overmolding on said assembly (212), particularly on said breathable and waterproof membrane (215).

10. The shoe (200) according to claim 9, characterized in that said  
30    inshoe (227) is provided separately and is coupled hermetically to said

assembly (212) by gluing.

11. A method for manufacturing a breathable and waterproof sole, consisting in:

- injection-molding at least one perforated lower sole layer (318),
- 5    – arranging, inside a mold, a breathable and waterproof membrane element (322) on said at least one perforated lower layer (318),
- arranging at least one breathable element (321) on top of said breathable and waterproof membrane element (322),
- covering with an adhesive film (321b) the surface (321a) of said at  
10   least one breathable element (321) that lies opposite said breathable and waterproof membrane element (322),
- overmolding a peripheral skirt (320) on said at least one perforated lower layer (318) and laterally to said at least one breathable element (321),
- 15   – removing said adhesive film (321b).

12. A method for providing a perforated portion of a breathable and waterproof sole, which consists in injecting melted polymeric material in a mold (340) constituted by a female mold part (341) and an upper closing mold part (342), said female mold part being provided with pin-shaped  
20   inserts (343) that protrude in the direction in which said mold (340) opens and are located at the region of said portion of the sole that is assigned to vapor permeation, plate-like sealing means (345) being interposed with interference between the apex surface (344) of said pin-shaped inserts (343) and said upper closing mold part (342).

25    13. The method according to claim 12, characterized in that said plate-like sealing means (345) are constituted by plates (346) made of polymeric material, to be arranged at each one of said pin-shaped inserts (343), said plates (346) being wider than the corresponding said pin-shaped insert (343).